ANALYSIS OF VITAMIN B12 IN SELECTED FORTIFIED AND NON-FORTIFIED PROCESSED FOODS VIA LIQUID CHROMATOGRAPHY METHOD

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Background:
Meat, fish, milk, and their products are the main sources of Vitamin B12 in human diets. Vitamin B12 is also present in processed foods such as breakfast cereals, breads and flavored drinks. Most of the methods of analysis for Vitamin B12 in food, such as microbiological assays, colorimetric analysis and titrimetric procedures require more reagents and time for sample extraction. Hence, a High-Pressure Liquid Chromatography (HPLC) method for the determination of Vitamin B12 in fortified and non-fortified processed foods was explored.

Objectives:
The study aimed to optimize, develop and validate a compatible extraction and chromatographic method for quantification of the Vitamin B12 and to analyze Vitamin B12 present in selected fortified and non-fortified processed foods.

Materials and Methods:
Food samples were taken from three (3) collection points in Metro Manila markets. Screening of chromatographic columns, mobile phase and extraction solution optimization were done using HPLC isocratic mode. The method developed was optimized and validated based on Eurachem Guide. The selected processed foods were prepared, homogenized and extracted. The extract products were analyzed using the developed method.

Results and Findings:
Using Waters HPLC Alliance system, twenty (20) fortified samples and ten (10) non-fortified samples were analyzed for moisture and vitamin B12 analysis. The optimized and validated chromatographic method for vitamin B12 was achieved on a reverse phase C18, with UV detection at ambient temperature. The method was validated for linearity, range, limit of detection, limit of quantification, specificity, precision, accuracy and system suitability. The summary of the method validation showed that the method developed was fit for its intended purpose. Analyses of the Vitamin B12 per 100 gram of edible portion of the food samples ranged from 0.01 to 1.0 μg/100g for non-fortified foods and 0.01 to 3.0 μg/100g for fortified foods.

Conclusion and Recommendation:
Extraction and chromatographic method for quantification of Vitamin B12 in selected fortified and non-fortified foods were developed, optimized and validated. Furthermore, the analytical method developed for vitamin B12 could be applied for routine analysis of Vitamin B12 quantification in similar matrices of analyzed foods. Method development studies and investigation for the presence of other B-Vitamins such as biotin, pantothenic acid and folic acid in food should also be done as part of the generation of food composition data activities by the FNRI.